What is claimed is

1. Method for creating a stepped structure on a substrate, wherein the stepped structure includes at least a first portion with a first thickness and a second portion with a second thickness, comprising:

(a) applying a layer sequence of a first oxide layer, a first nitride layer, and a second oxide layer to the substrate;

(b) removing a portion of the second oxide layer and a portion of the first nitride layer to expose a portion of the first oxide layer;

(c) removing a part of the first nitride layer above the first oxide layer and below the second oxide layer to establish the first region of the stepped structure;

(d) changing the thickness of the first oxide layer at least in the first region established in step (c) to establish the first thickness thereof; and

(e) removing a part of the first nitride layer above the first oxide layer and below the second oxide layer to establish the second region of the stepped structure.

2. Method of claim 1, comprising:

(f) exposing the stepped structure.

3. Method of claim 1, wherein the step (d) includes the step of increasing the thickness of the first oxide layer at least in the first region.

4. Method of claim 3, wherein the step of increasing includes an oxidation.

5. Method of claim 1, wherein the step (d) includes the step of thinning the first oxide layer at least in the first region.

6. Method of claim 5, wherein the step of thinning includes the etching of the first oxide layer.

7. Method of claim 5, wherein the step of thinning includes the following steps:

removing the first oxide layer at least in the first region; and

applying a new oxide layer at least in the first region with a thickness smaller than the thickness of the first oxide layer.

8. Method of claim 1, wherein the steps (c) and (e) include selective wet-chemical etching of the first nitride layer.

9. Method of claim 8, wherein the wet-chemical etching takes place using hot phosphoric acid (~ 80% H_3PO_4, T ~ 155°C) at an etching rate of 1 nm/min to 20 nm/min for a period of time of 1 minute to 400 minutes.

10. Method of claim 1, wherein the step (b) includes the following steps:

(b.1) applying and structuring a photoresist on the layer sequence to establish regions to be exposed; and

(b.2) etching the second oxide layer and the first nitride layer up to the first oxide layer.

11. Method of claim 1, comprising after step (e):

depositing an electrically conducting layer in the first region and in the second region.

12. Method of claim 1, comprising after step (e):

performing an implant with respect to the substrate to form a doped region in the portion of the substrate only covered by the first oxide layer.

13. Method of claim 11, wherein the electrically conducting layer is conformly deposited on the substrate and then etched anisotropically and selectively to the oxide layers.

14. Method of claim 11, wherein the step (f) comprises:

(f.1) depositing a second nitride layer;

(f.2) depositing a third oxide layer;

(f.3) removing the third oxide layer selectively to the second nitride layer, so that an oxide remainder remains at a step formed by the exposing of the first oxide layer in step (b);

(f.4) removing the second nitride layer selectively to the second oxide layer, so that the nitride remainder remains at the step;

(f.5) removing the oxide layers selectively to the nitride layers and selectively to the substrate;

(f.6) removing the nitride layers; and

(f.7) removing the first oxide layer outside the first and second regions.

15. Method of claim 1, wherein the stepped structure is a gate oxide of a MOS transistor.

16. Method of claim 1, wherein the oxide layers are SiO_2 layers, wherein the nitride layers are Si_3N_4 layers, wherein the substrate is a Si substrate, and wherein the electrically conducting layer is a polysilicon layer.

17. Method of claim 1, wherein in step (d) the thickness of the first oxide layer is repeatedly changed to create a structure with a plurality of steps.